

6-9-jugi, mediales, rotundati, mediocres; sporangia glabra; indusia ex pilis pluribus albidis rigidis suberectis longis constata.

Type in the herbarium of Field Museum of Natural History, no. 518164, collected near Mito, Peru, altitude about 2700 meters, in partly sunny places of thickets, July 8-22, 1922, by J. Francis Macbride and William Featherstone (no. 1667); isotype (an immature plant) in U. S. National Herbarium, no. 1121953.

ZOOLOGY.—*Geographical distribution of the nemerteans of the Pacific coast of North America, with descriptions of two new species.*¹ WESLEY R. COE, Scripps Institution of Oceanography. (Communicated by WALDO L. SCHMITT.)

An examination of the nemerteans in the collections of the United States National Museum revealed two species from the Pacific coast of North America believed to be new to science, in addition to many others from new localities. Most of them were dredged on the cruises of the U.S. Bureau of Fisheries steamer *Albatross* off the coasts of California, Washington, and Alaska and in the seas adjacent to the Japanese islands. These records are included in the following list, which shows the habitat and geographical distribution of each of the Pacific coast species so far as known at the present time. This list will supplement the data contained in the "Revision of the nemertean fauna of the Pacific coasts of North, Central and northern South America" (Coe, 1940). The total number of species now known from the Pacific coast of North America is increased to 99. Of these, 65 have been found only on the Pacific coast of North America, including Bering Sea and the adjacent Arctic coast of Alaska; 16 occur also on the coasts of Japan; 11 on the Atlantic coast of North America; 14 in European waters; 5 on South African shores; and 7 on the Pacific coast of South America.

Order PALEONEMERTEA
Family Tubulanidae

1. *Tubulanus albocinctus* Coe. Among red

¹ Contributions of the Scripps Institution of Oceanography, University of California, new ser., no. 216. Received October 27, 1943.

Dryopteris dumetorum belongs to the general group of *D. rudis* (Kunze) C. Chr., though it is not closely related to that species itself. Apparently it has no very near relatives; but the boundaries of this group as defined by Christensen are not very clear, and its dozen or so species need to be redescribed and compared on the basis of better material, the original specimen in several instances having lacked, for example, the rhizome.

algae at depths of 100 to 200 meters; off coast of southern California.

2. *T. capistratus* Coe. Intertidal zone; coast of Alaska to Monterey Bay, Calif.; Japan. One specimen nearly a meter in length was collected by the *Albatross* in 1906 near Hakodate, Japan.

3. *T. cingulatus* Coe. Yes Bay, Behm Canal, Alaska, 290-400 meters; intertidal zone; Monterey Bay, Calif.

4. *T. frenatus* Coe. Intertidal zone; southern California.

5. *T. nothus* Bürger. Intertidal zone to 40 meters; coast of Alaska; South Africa; Mediterranean. The Alaska records are from preserved specimens only, and there remains the possibility they may actually have represented *T. annulatus* (Montagu), which is similar in markings and which is widely distributed on northern coasts from Greenland to Norway, Great Britain and the Mediterranean and has also been reported from South Africa.

6. *T. pellucidus* Coe. Intertidal zone; coasts of New England and southward; Monterey Bay to San Diego, Calif.

7. *T. polymorphus* (Renier). Intertidal zone; northern coasts of Europe; Mediterranean; Aleutian Islands, Alaska, British Columbia to Monterey Bay, Calif.

8. *T. sexlineatus* Griffin. Intertidal zone; Alaska to southern California.

9. *Carinomella lactea* Coe. Intertidal zone to 20 meters; Monterey Bay to San Diego, Calif. Burrowing form, found on sandy shores of boys.

Family Carinomidae

10. *Carinoma mutabilis* Griffin. Intertidal

zone to 40 meters; British Columbia to Gulf of California. Burrows on sandy shores of bays.

Family Cephalothricidae

11. *Cephalothrix major* Coe. Intertidal zone; southern California.

12. *Procephalothrix spiralis* Coe. Intertidal zone to 20 meters; New England; Alaska to San Diego, Calif.

Order HETERONEMERTEA

Family Baseodiscidae

13. *Baseodiscus delineatus* (Delle Chiaje). Widely distributed in both Northern and Southern Hemispheres; Mediterranean to Cape Verde Islands; Mauritius; Bermuda; Barbados; Fiji Islands; Chile; Japan; Gulf of California.

14. *B. delineatus* var. *curtus* (Hubr.). Coextensive with the preceding.

15. *B. mexicanus* Bürger. Gulf of California; west coasts of Mexico and Panama; Galápagos Islands; intertidal zone to 100 meters; among shells and corals.

16. *B. princeps* Coe. Alaska to Puget Sound; intertidal zone and off shore to depths of 50 meters or more; off Goloi Island, Alaska, 50 meters; off Oshima, Japan, 250 meters (*Albatross*); Sea of Japan 135–290 meters (*Albatross*); off Ose Saki, Japan, 260 meters (*Albatross*); south of Hokkaido, Japan, 340 meters (*Albatross*). This species was also found by Yamaoka (1940) in the intertidal zone at Hokkaido, Japan, but was erroneously assigned by him to *B. curtus* Hubr. Supplementing the original description by Coe (1901) it has since been ascertained that some individuals of *B. princeps* on the coast of Alaska and in Puget Sound have the lateral margins and ventral surface of the head white or colorless. These white areas disappear when the head is strongly contracted.

17. *B. punnetti* Coe. Monterey Bay to Gulf of California, Mexico; intertidal zone to 380 meters.

18. *Zygeupolia rubens* (Coe). Intertidal zone to 50 meters; southern New England and southward to North Carolina; Monterey Bay, Calif., to Ensenada, Mexico.

Family Lineidae

19. *Euborlasia maxima* Coe. Gulf of California.

20. *E. hancocki* Coe. Coasts of Mexico, Panama, and Peru; 17 to 100 meters.

21. *E. nigrocincta* Coe. San Francisco Bay, 20 meters; Monterey Bay, Calif., to Ensenada, Mexico; intertidal zone to 30 meters.

22. *Euborlasia variegata*, n. sp. This species was represented in a collection of nemerteans from Alaska by a headless fragment about 160 mm in length. The width of the body is 7 to 10 mm and the thickness 6 to 8 mm. The body is somewhat flattened in the middle intestinal region but becomes rounded posteriorly. The posterior extremity is rounded and without caudal cirrus.

This specimen is put on record because of the remarkable and distinctive coloration of the body. In spite of preservation in alcohol for about two years the color pattern is still conspicuous, consisting of an orange ground color, overlaid with bluish black longitudinal bands and transverse rings. On some portions of the body the black pigment covers most of the dorsal and ventral surfaces but in other portions it is confined to narrow rings which encircle the body. Several adjacent rings become wide and confluent on dorsal or ventral surface, or both, giving the appearance of broad, interrupted longitudinal bands connected by narrow lateral rings. This specimen represents a ripe female and the abundance of ova presumably influences the color pattern to some extent.

Sections show that the bluish-black pigment is confined to the cutis and that the pattern is formed by the relative thickness of the pigment layer, which is thin in certain areas and much thicker and denser in others. The epithelium and the muscular layers are colorless or yellow and the intestinal epithelium and ova deeper yellow or orange.

This specimen (U.S.N.M. 20633) was dredged at a depth of about 30 meters in Port Graham, Cook Inlet, Alaska, by Dr. Waldo L. Schmitt in connection with the Alaska King Crab Investigation, 1941.

23. *Lineus bilineatus* (Renier). Northern coasts of Europe; Mediterranean; Madeira; South Africa; Alaska to San Diego, Calif.

24. *L. flavescens* Coe. Southern California to Gulf of California, Mexico.

25. *L. geniculatus* (Delle Chiaje) (= *L. digueti* Joubin). Intertidal zone to 30 meters; Gulf of California; west coasts of Mexico and Panama; Mediterranean and Black Seas; west coast of Africa.

26. *L. pictifrons* Coe. Intertidal zone; Puget

Sound to coast of Mexico.

27. *L. ruber* (O. F. Müller). Intertidal zone to 10 meters; circumpolar; Siberia; northern coasts of Europe; Mediterranean: Madeira to South Africa; Greenland to southern New England; Alaska to Monterey Bay, Calif.

28. *L. rubescens* Coe. Monterey Bay to San Diego, Calif.

29. *L. torquatus* Coe. Coast of Alaska to San Francisco Bay.

30. *L. vegetus* Coe. Found in the intertidal zone beneath stones and decaying vegetation in estuaries, harbors and bays, as well as in crevices of rocks and among corallines and other growths exposed to the full force of the surf; sometimes above middle of intertidal zone; occasionally in brackish water. Commonly associated with dead barnacles and mollusks; feeds on ciliates and other small organisms, living or dead. San Francisco Bay, Calif., to Ensenada, Mexico. Reproduces asexually by fragmentation as well as sexually by fertilized eggs; has remarkable regenerative capacity.

31. *Micrura alaskensis* Coe. Intertidal zone; Prince William Sound, Alaska, to Ensenada, Mexico; Japan.

32. *M. impressa* (Stimpson). Bering Strait.

33. *M. nebulosa* Coe. Dredged at depths of 120–900 meters off the coasts of Alaska and California.

34. *M. nigrirostris* Coe. Among kelp holdfasts and other growths on rocks at low-water mark and below; southern California.

35. *M. olivaris* Coe. Monterey Bay and off San Francisco, Calif.; low-water mark to 120 meters.

36. *M. pardalis* Coe. Intertidal zone; Monterey Bay, California, to Ensenada, Mexico.

37. *M. verrilli* Coe. Intertidal zone and below; Alaska to Monterey Bay, Calif.

38. *M. wilsoni* Coe. Intertidal zone to 35 meters; Monterey Bay, California, to Gulf of California.

39. *Cerebratulus albifrons* Coe. Muddy flats between tide marks and below to depths of 100 meters or more; Alaska to San Diego, Calif.

40. *C. californiensis* Coe. On muddy shores and in bays to depths of 35 meters or more; Puget Sound to Gulf of California.

41. *C. herculeus* Coe. Bering Sea, coast of Alaska to central California and off the coast to depths of 60 meters or more.

42. *C. lineolatus* Coe. Muddy bays, southern California, Gulf of California and west coast of

Mexico; intertidal zone to 70 meters or more.

43. *C. longiceps* Coe. Intertidal zone; Yakutat Bay, Alaska; off Oshima, Japan, 250 meters.

44. *C. marginatus* Renier. Sandy and muddy shores to depths of 100 meters; circumpolar; Norway to Madeira; Greenland and Labrador to Cape Cod; Alaska to San Diego, Calif.; Bering Sea (62°N. 173°W.), 70 meters; Japan.

45. *C. montgomeryi* Coe. Coast of Siberia; Bering Sea; Alaska to Monterey Bay, Calif.; Behm Canal, Alaska, 150–400 meters; Moss Cape, Belkofski Peninsula, 40 meters; off Hokkaido, Japan, 600 meters.

46. *C. occidentalis* Coe. Alaska to San Francisco Bay; off central California, 120 meters; Cold Bay, Alaska, 40 meters; Bellingham Bay, Wash., 20 meters; intertidal zone, Prince William Sound to Puget Sound.

47. *C. signatus* Coe. Bering Sea, 110 meters.

48. *Diplopleura vivesi* Joubin. Gulf of California, Mexico.

Order HOPLONEMERTEA

MONOSTYLIFERA

Family Empletonematidae

49. *Empletonema bürgeri* Coe. Intertidal zone to 500 meters; Alaska to Monterey Bay, Calif.; off Vancouver Island, 300 meters; Chatham Strait, Alaska, 500 meters; off Oshima, Japan, 250 meters.

50. *E. gracile* (Johnston). Northern coasts of Europe to Madeira; Aleutian Islands and coast of Alaska to Ensenada, Mexico; Chile; Kamchatka to Japan; intertidal zone to 100 meters. In many localities on northern coasts the most abundant of all species of nemerteans.

51. *E. purpuratum* Coe. Aleutian Islands.

52. *Nemertopsis gracilis* Coe. Intertidal zone and below; Puget Sound to Ensenada, Mexico.

52a. *N. gracilis* var. *bullocki* Coe. Intertidal zone; coast of central California.

53. *Paranemertes californica* Coe. Monterey Bay, Calif., to Ensenada, Mexico; in sandy and muddy bays.

54. *P. carnea* Coe. Intertidal zone; Alaska to Puget Sound.

55. *P. pallida* Coe. Intertidal zone; Alaska.

56. *P. peregrina* Coe. Commander Islands; Aleutian Islands, Alaska, to Gulf of California; Kamchatka to Japan. Intertidal zone and below, among mussels and other growths; often very abundant.

57. *Dichonemertes hartmanae* Coe. Intertidal zone; San Diego, Calif.

Family Carcinonematidae

58. *Carcinonemertes epialti* Coe. Commensal parasite on crabs of the genera *Portunus*, *Puggetia* and *Euphyllax*. Monterey Bay to San Diego, Calif.; Peru.

Family Ototyphlonemertidae

59. *Ototyphlonemertes spiralis* Coe. On sandy shores of bays; San Diego, Calif.

Family Prosorhochmidae

60. *Prosorhochmus albidus* (Coe). Intertidal zone; Monterey Bay, Calif., to Ensenada, Mexico.

61. *Oerstedia dorsalis* (Abildg.). Intertidal zone and below; circumpolar; Norway to Mediterranean; Madeira; Nova Scotia to Florida; Puget Sound to Gulf of California.

Family Amphiporidae

62. *Zygonemertes albida* Coe. Intertidal zone; British Columbia to Ensenada, Mexico.

63. *Z. thalassima* Coe. Intertidal zone; Alaska.

64. *Z. virescens* (Verrill). Intertidal zone and below to depths of 120 meters; Bay of Fundy, New England and southward to North Carolina; Puget Sound to Gulf of California.

65. *Amphiporus angulatus* (Fabricius). Circumpolar; Greenland; Davis Strait; Labrador to Cape Cod; Bering Strait; Bering Sea; Aleutian Islands and Kamchatka to Japan; Alaska; British Columbia; Puget Sound and southward to Point Conception, Calif.

66. *A. bimaculatus* Coe. Intertidal zone; Alaska to Ensenada, Mexico; off San Diego, Calif., 250 meters; Okhotsk Sea, 140 meters.

67. *A. californicus* Coe. Intertidal zone to 80 meters or more; coast of southern California.

68. *A. cruentatus* Verrill. Intertidal zone to 80 meters or more; New England to Florida; Puget Sound to San Diego, Calif.

69. *A. flavescens* Coe. Monterey Bay, Calif., to Ensenada, Mexico.

70. *A. formidabilis* Griffin. Bering Island, Aleutian Islands, coast of Alaska and southward to Monterey Bay, California.

71. *A. fulvus* Coe. Intertidal zone to 85 meters; southern California.

72. *A. gelatinosus* Coe. The absence of the proboscis in the type specimen did not permit

a satisfactory description of this species (Coe, 1905). Specimens collected by the U.S. Fish Commission have since become available for study and in these the proboscis proves to be typical for the genus *Amphiporus*. The basis is pear-shaped, of moderate proportions and not quite so long as the rather slender central stylet which measures 0.16 to 0.18 mm in length in an individual 150 mm long. There are four pouches of accessory stylets, with 4-5 stylets in each, and 15 to 17 proboscidal nerves. The body contains a larger proportion of gelatinous tissue than has been reported for any other species of the genus. Length of body 100 to 150 mm; width 10 to 16 mm.

Dredged at a depth of about 300 meters southwest of Kodiak Island, Alaska; at 400 to 450 meters in Clarence Strait; at 40 meters near Port Townsend, Wash., and at 130 meters in Uraga Strait, Japan.

73. *A. imparispinosus* Griffin. Intertidal zone to 50 meters; coast of Siberia, Bering Sea, Alaska to San Diego, Calif., and Ensenada, Mexico. Abundant in many localities.

73a. *A. imparispinosus* var. *similis* Coe. Differs from the typical form in having 2, instead of 3, pouches of accessory stylets. Puget Sound to Ensenada, Mexico.

74. *A. macracanthus* Coe. Dredged in the Arctic Ocean off the northern coast of Alaska.

75. *Amphiporus maculosus*, n. sp. This species is distinguishable from others of the genus by the reddish brown spots and blotches on the dorsal surface. Another species, *A. nebulosus* Coe, has the dorsal surface more nearly covered with confluent dark brown spots and blotches, while in *A. maculosus* they are widely separated. *A. nebulosus* has 18 to 25 ocelli on each side of head but in the only specimen of *A. maculosus* available for study ocelli could not be detected. The stylet basis in *A. nebulosus* is much swollen posteriorly and about as long as the stylet, while in *A. maculosus* it is only moderately enlarged posteriorly and much longer than stylet. The nephridia, caecal diverticula and proboscis show minor anatomical differences.

Body moderately slender, narrowed posteriorly; head with inconspicuous oblique grooves. Length of type specimen 36 mm, width 3 mm, thickness 2 mm after preservation.

Color of body pale gray, with numerous reddish brown spots and blotches on dorsal surface; head without spots. These markings vary

in size from dots to large blotches, usually separated by much larger spaces without pigment. The spots in this specimen cover less than one-third the dorsal surface. Ventral surface pale gray.

Ocelli could not be detected either in the specimen cleared in oil or in the sections.

Proboscis sheath extends entire length of body. Proboscis large, stylet basis pear-shaped, about twice as wide posteriorly as anteriorly and twice as long as the posterior diameter. Central stylet two-thirds as long as basis. In this specimen there are 18 large proboscidial nerves. Each of the two accessory stylet pouches contains three stylets.

Cerebral sense organs large, situated anterior to brain, each with a relatively large canal leading anteriorly to an oblique groove on lateroventral surface near tip of head. Cephalic glands voluminous.

Nephridia extend anteriorly as far as posterior borders of cerebral ganglia. Intestinal caecum extends forward on ventral side of pylorus but terminates some distance posterior to brain; caecal diverticula short, not reaching brain. Gonads more numerous than intestinal diverticula; oviducts open ventrolaterally.

The single known specimen was collected at Lagoon Reef, St. Paul Island, Bering Sea. Type, U.S.N.M. no. 16797.

76. *A. nebulosus* Coe. Intertidal zone; coasts of Alaska and Japan.

77. *A. occidentalis* Coe. Dredged at depths of 70 to 170 meters off the coast of Washington.

78. *A. pacificus* Coe. Dredged at depths of 70 to 180 meters in the Bering Sea and off the coasts of Washington and California. In two specimens from Bering Sea the ocelli are more numerous than figured by Coe (1895) and are arranged in two groups on each side of head. The anterior, marginal, group on each side consists of about 10 large and 8 smaller ocelli, while the posterior, cerebral, group has about 8 large and 6 small ocelli. Most of the cups of those in the marginal groups are directed forward and those of the cerebral groups backward.

79. *A. paulinus* Punnett. Pribilof Islands, Bering Sea.

80. *A. punctatulus* Coe. Intertidal zone; Catalina Island, Calif.

81. *A. rubellus* Coe. Intertidal zone to 200 meters; coast of southern California.

82. *A. tigrinus* Coe. Intertidal zone; British Columbia and Puget Sound.

Family Tetrastemmatidae

83. *Amphinemertes caeca* Coe. Dredged with tunicates at a depth of 5 meters; Kodiak Island, Alaska.

84. *Tetrastemma aberrans* Coe. Intertidal zone; coast of Alaska.

85. *T. bicolor* Coe. Shallow water; Kodiak Island, Alaska.

86. *T. bilineatum* Coe. Intertidal zone; San Diego, California.

87. *T. candidum* (Müller). Circumpolar; Greenland and Norway to Madeira; South Africa; Labrador to New England and southward; Alaska to Ensenada, Mexico.

88. *T. nigrifrons* Coe. Intertidal zone; Puget Sound to coasts of Mexico and Costa Rica; Japan.

89. *T. quadrilineatum* Coe. Intertidal zone; Monterey Bay, Calif. to Ensenada, Mexico.

90. *T. reticulatum* Coe. Southern California; intertidal zone.

91. *T. sexlineatum* Coe. Dredged at a depth of 35 meters near San Clemente Island, Calif.

92. *T. signifer* Coe. Intertidal zone to 10 meters; Monterey Bay to San Diego, Calif.; locally common on kelp holdfasts.

POLYSTYLIFERA REPTANTIA

Family Drepanophoridae

93. *Drepanophorus crassus* (Quatrefages). Dredged at depths of 2 to 100 meters or more; Arctic Ocean; European coasts; tropical Pacific islands; Cape San Lucas, Mexico; Panama; West Indies; Peru.

94. *D. ritteri* Coe. Dredged at depths of 50 to 300 meters off coast of southern California.

POLYSTYLIFERA PELAGICA

Family Planktonemertidae

95. *Planktonemertes agassizii* Woodworth. Bathypelagic at depths of 1000 meters or more off coasts of Panama and Ecuador.

Family Nectonemertidae

96. *Nectonemertes pelagica* Cravens and Heath. Bathypelagic at depths of 100 meters or more off coasts of California and northern South America.

Family Pelagonemertidae

97. *Pelagonemertes brinkmanni* Coe. Bathypelagic at depths of 600 meters or more. Bering Sea and off coasts of Alaska, Aleutian Islands and Kamchatka.

Family Dinonemertidae

98. *Dinonemertes mollis* Coe. Bathypelagic at depths of 600 meters or more; off coast of Mexico.

Order BDELLONEMERTEA

Family Malacobdellidae

99. *Malacobdella grossa* (Müller). Commensal in various species of bivalve mollusks. Northern coasts of Europe, Mediterranean; Nova Scotia to Chesapeake Bay; Puget Sound to California.

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Obituary

The premature death of CHARLES ELMER RESSER, on September 18, 1943, at the age of 54, deprived the ACADEMY of one of its newest members. Born in East Berlin, Pa., on April 28, 1889, young Resser grew up in country underlain by the Cambrian rocks and fossils to which he devoted much of his later life. He graduated from Pennsylvania State Teachers College in 1912 and in 1913 received his A.B. degree from Franklin and Marshall College. Here he came under the influence of the inspiring geologist, Justin Roddy, who imparted his enthusiasm for fossils and the earth sciences to his student.

In 1914 Dr. Resser became assistant to Charles D. Walcott, great student of the Cambrian. Working under this mentor for some years, he received his paleontological training and his wide knowledge of the Cambrian period and its fossils. In 1915 he became assistant curator of paleontology in the U. S. National Museum and associate curator in 1923. From 1929 until his death he held the title of curator of stratigraphic paleontology.

Although Dr. Resser's practical training was received under Walcott, he continued his more formal education at Princeton and George Washington Universities, receiving the Ph.D. degree from the latter in 1917. In 1915 he was appointed part-time instructor in geology and geography in the George Washington University and was advanced to assistant professor in 1923. This position was relinquished in 1932. Dr. Resser also taught geology in the University of Maryland for several years.

After the death of Walcott in 1927, Dr. Resser became custodian of the Cambrian collections and devoted most of his time to research on the fossils and stratigraphy of this period. He made field investigations in the

Great Basin, Rocky Mountains, and Canadian Rockies and in his later years made several trips into the southern Appalachians to study Cambrian strata. Two visits were made to Europe for the same purpose. This concentrated effort on one period of time gave Dr. Resser a knowledge of Cambrian fossils, particularly trilobites, which enabled him to see relationships between strata in this country and abroad that had hitherto been unsuspected. His untimely death abruptly terminated several ambitious programs that would have brought to fruition the results of his life's studies.

Although Dr. Resser's scientific interest lay in Cambrian fossils, he was perhaps equally devoted to the service of his fellow men through his activities in church and educational affairs. He was long time president of the District of Columbia Sunday School Association, a member of the Board of the Central Union Mission, and chairman of the Board of Trustees of the Washington City Church of the Brethren. He was a member of the Board of Trustees of Bridgewater College and was active in behalf of other colleges of his church.

Foremost of Dr. Resser's honors was the D.Sc. conferred by his alma mater, Franklin and Marshall College, in 1934. He was a fellow of the Geological Society of America and a member of Sigma Gamma Epsilon.

In 1908 Dr. Resser married Anna M. Evans, who, with his two children, Harold and Mrs. Helen R. Yates, survives him. By his death Christianity has lost a devoted servant and geology and the ACADEMY a member who was not granted time to fulfill his best promise. His affable disposition and kindly ways will be missed by all his friends.

G. A. COOPER